OARnet

National Aeronautics and Space Administration

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Several alternative architecture's for file transfer were investigated, concentrating primarily on transport level protocols available with IP, and data link level protocols which could be used under IP. Some consideration was given to using protocols other than TCP/IP also.

The investigation involved discussions with NASA personnel and subcontractors and other ACTS experimenters familiar with the characteristics of ACTS, as well as running experiments and doing some analysis of the results.

Completion of the investigation led to a determination to use TCP/IP over ATM equipment to support file transfer and other applications being run by OSC/OSU over NASA ACTS. The transport protocol needed to be reliable, and by adjustment of the window sizes and appropriate modifications of the buffer space in the operating systems of the computers involved in doing the transfer, as well as use of the modified version of TCP developed to handle long latency, we felt that good performance characteristics could be obtained through the use TCP/IP over ACTS.

The lower level transport chosen is ATM. HIPPI was also evaluated, but it was felt that ATM would be more cost-effective and would be more suitable for the other two sites involved in the ACTS experiment. The cost of putting HIPPI at all three sites was prohibitive and the ATM equipment could be obtained commercially and was felt to be a mature enough technology that the risk of non-performance was within acceptable limits.